METHOD AND APPARATUS FOR SELECTING REFERENCES FOR PREFETCHING IN AN OPTIMIZING COMPILER

ABSTRACT

One embodiment of the present invention provides a system that generates code to perform anticipatory prefetching for data references. During operation, the system receives code to be executed on a computer system. Next, the system analyzes the code to identify data references to be prefetched. This analysis can involve: using a two-phase marking process in which blocks that are certain to execute are considered before other blocks; and analyzing complex array subscripts. Next, the system inserts prefetch instructions into the code in advance of the identified data references. This insertion can involve: dealing with non-constant or unknown stride values; moving prefetch instructions into preceding basic blocks; and issuing multiple prefetches for the same data reference.

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